

1969

OPERATING
SUMMARY

WESTMINSTER

***water pollution
control plant***

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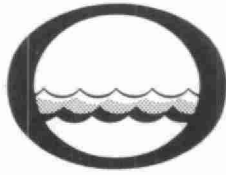
Division of Plant Operations

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Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario


The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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WESTMINSTER
water pollution control plant

operated for

THE TOWNSHIP OF WESTMINSTER

by the

ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY

WESTMINSTER TOWNSHIP
WATER POLLUTION CONTROL PLANT

INFLUENT

CONTROL BUILDING

SLUDGE HOLDING TANK

CHLORINE CONTACT CHAMBER

BYPASS

WASTE SLUDGE

TO TANK TRUCK

SEDIMENTATION TANKS

AERATION TANKS

EFFLUENT SAND FILTERS (2)

EFFLUENT TO DINGMAN CREEK

DESIGN DATA

PROJECT NO.	2-0033-59	TREATMENT	Extended Aeration
DESIGN FLOW	0.25 mgd	DESIGN POPULATION	5,000

PRETREATMENT

Comminution

Type: Barminutor
Size: One Model B (12")
Chicago Pump Co.

RAW SEWAGE PUMPS

Type: Chicago Pump
Size: Two 100 gpm @ 23' tdh (#1 pump
standby powered by Wisconsin
gasoline engine)

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air; single-pass
Size: Two 54' x 27' x 14' (252,000 gal)
Retention: 24.2 hr

Diffusers

- Discfusers on swing arm

Air Supply

Type: Sutorbilt
Size: Three 337 scfm @ 7 psi

Secondary Sedimentation

Type: Link-Belt

Size: Two 54' x 8' x 9.25' (50,200 gal)
Retention: 4.80 hr
Loading: Surface, 580 gal/ft²/day
Weir, 1955 gal/ft/day

CHLORINATION

Type: W & T
Size: One 100 lb/day

Chlorine Contact Chamber

Size: One 10' x 7' x 9' (3930 gal)
Retention: 22.7 min

OUTFALL

- to Dingman Creek

TERTIARY TREATMENT

Effluent Sand Filters (used in warm weather)

Size: Four units (26,900 sq ft or 0.62 acres)
Depth: 30" of sand (min)
Capacity: .405 mil gal/acre/day

SLUDGE HANDLING

Sludge Holding Tank

Size: 4,460 cu ft or 27,850 gal

'69 REVIEW

GENERAL

This project consists of a 0.25 mgd total oxidation treatment plant with comminution, raw sewage pumping, diffused air aeration, final settling, chlorination, effluent sand filters, a sludge holding tank and liquid sludge disposal. Also included is about a mile and a half of 21-inch diameter trunk sewer.

The plant's chief operator is aided by a casual worker at weekends, vacation-time, and periods of sickness or unusual activity.

During the year, several industrial waste dumps caused minor operational difficulties. However, they had no lasting effect on the treatment process.

EXPENDITURES

The operating cost for 1969 was \$17,264.18, an increase of \$1,793.11 over 1968. The cost per million gallons treated in 1969 was \$136.53 less than the 1968 unit cost of \$203.78 -- and decreased because of higher flows.

PLANT FLOWS

A total of 126.75 million gallons of sewage was treated at this plant in 1969, compared with 75.92 million gallons in 1968. This is an increase of 50.83 million gallons, or 67%. The average daily flow for the year was 350,000 gallons, and represents 140% of the design flow of 250,000 gpd. The maximum average daily flow for a month occurred in April, September and November, when the flow was 410,000 gallons or 164% of the design capacity. The maximum flow in any one day was 580,000 gallons in June. The probability of daily flow graph shows that the design flow was exceeded 82% of the time compared with 40% in 1968.

The average daily flow graph shows a rapid increase in flows since the plant was put in operation in 1961. The 1969 flow followed previous trends after a decrease in 1968.

CHLORINATION

A total of 1814 lbs. of chlorine was used at an average dosage of 2.5 mg/l. During the same period in 1968, 1515 lbs. of chlorine were required to maintain an effluent residual of 0.5 mg/l.

PLANT EFFICIENCY

The average strength of the raw sewage for the year, based on monthly averages, was 97 mg/l BOD and 204 mg/l suspended solids. The BOD value was much lower than the 1968 value of 215 mg/l, and the suspended solids value was also lower. The final effluent had an average BOD of 10 mg/l and average suspended solids of 19 mg/l, which resulted in average reductions of about 90% for each.

From the probability graph, it can be seen that the effluent BOD met the OWRC objective of 15 mg/l 80% of the time, and suspended solids 60% of the time. The above results are based on composite samples taken every two weeks.

AERATION

The average loading on the aeration tank was 0.03 lbs. of BOD per pound of mixed liquor suspended solids as with 0.05 lbs. in 1968. The MLSS averaged 4791 mg/l, which is lower than the 1968 value of 5020 mg/l. An average of 2700 cu. ft. of air was required for each pound of BOD removed as compared to 2830 cu. ft. in 1968. Part of this decrease is due to the increase in concentrations of BOD and the greater number of pounds of BOD removed.

CONCLUSIONS

The plant operated at 140% of its design capacity after the City of London added a large subdivision to the sewer system.

The new pumping station, completed in 1968 by the City to pump some of the area wastes to the London treatment plant, was not used to stabilize the flows entering the Westminster plant.

This plant produced a reasonably good effluent although it was hydraulically overloaded. The sand beds improved effluent quality when it was possible to use them.

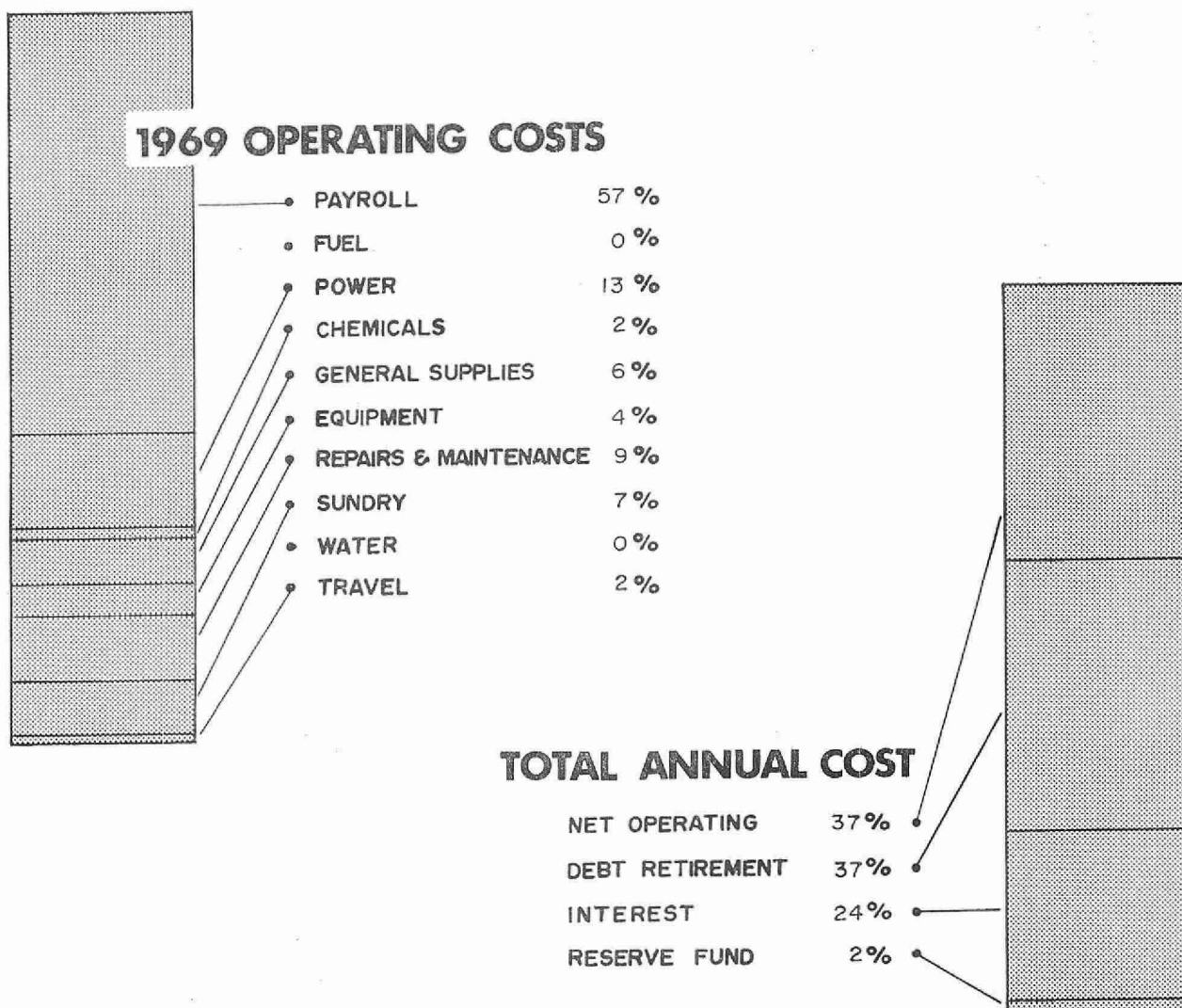
It is recommended that discussions be initiated with the Township of Westminster and the City of London to restrict flows to present levels.

PROJECT COSTS

NET CAPITAL COST (Final)	\$270,727.24
DEDUCT - Payments from Municipalities	<u>65,773.40</u>
Long Term Debt to OWRC	<u>\$204,953.84</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	\$ <u>78,720.51</u>
Net Operating	\$ 17,264.18
Debt Retirement	17,673.00
Reserve	887.19
Interest Charged	<u>11,474.32</u>
TOTAL	\$ <u>47,298.69</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 16,927.12
Deposited by Municipalities	887.19
Interest Earned	<u>981.82</u>
	\$ 18,796.13
Less Expenditures	<u>-</u>
Balance @ December 31, 1969	\$ <u>18,796.13</u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	55.72	\$10,614.93	\$190.49	11 cents
1966	65.66	13,449.12	204.81	25 cents
1967	88.08	13,914.02	157.97	17 cents
1968	75.92	15,471.07	203.78	11 cents
1969	126.45	17,264.18	136.53	16 cents

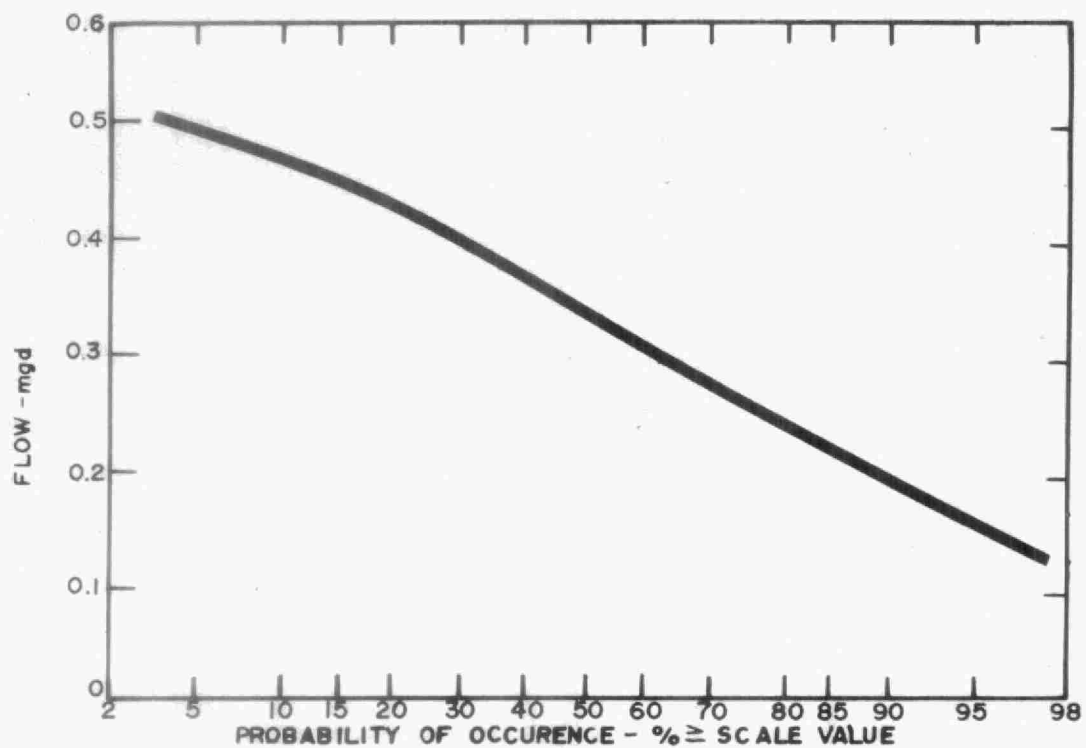
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	1276.46	836.18	142.27	-	198.03	-	35.12	-	-	9.66	-	55.20
FEB	1266.84	552.97	105.84	-	208.78	-	11.60	3.75	183.90	200.00	-	-
MAR	1154.51	552.97	124.46	-	195.38	-	91.79	83.79	20.74	29.88	-	55.50
APR	1116.47	727.96	113.98	-	187.68	-	45.21	-	28.61	13.03	-	-
MAY	1579.29	714.41	163.75	-	180.53	296.19	35.51	83.92	29.18	75.80	-	-
JUNE	1900.42	585.39	203.03	-	175.03	-	36.87	400.72	411.76	22.97	-	64.65
JULY	1205.15	597.85	254.46	-	172.28	-	28.86	-	134.59	17.11	-	-
AUG	1554.95	850.15	340.80	-	167.88	-	38.15	-	83.20	18.52	-	56.25
SEPT	2008.99	571.15	130.57	-	172.83	-	514.52	151.00	448.93	19.99	-	-
OCT	1518.21	570.38	198.96	-	164.03	-	123.35	-	100.70	293.74	-	67.05
NOV	1094.51	587.78	180.34	-	177.23	-	37.60	-	71.28	40.28	-	-
DEC	1588.38	579.97	172.19	-	172.83	-	63.67	-	-	473.32	-	126.40
TOTAL	17264.18	7727.16	2130.65	-	2172.51	296.19	1062.25	723.18	1512.89	1214.30		425.05

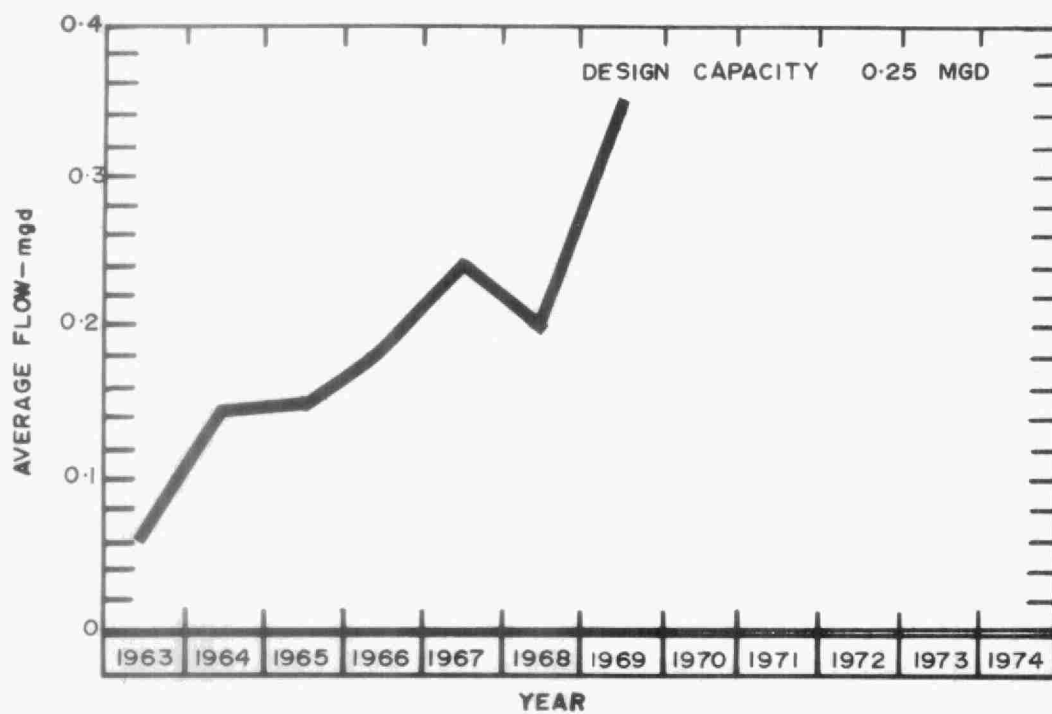
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$250.00



PROCESS DATA



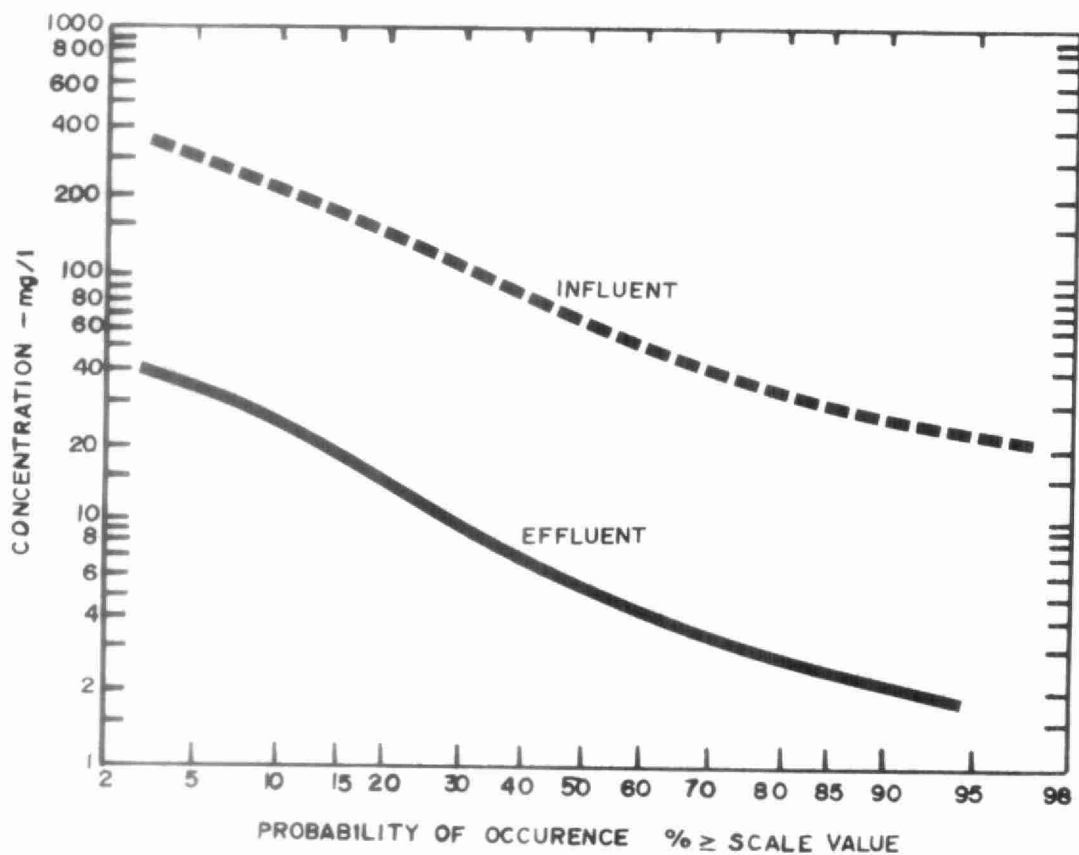
FL O W S



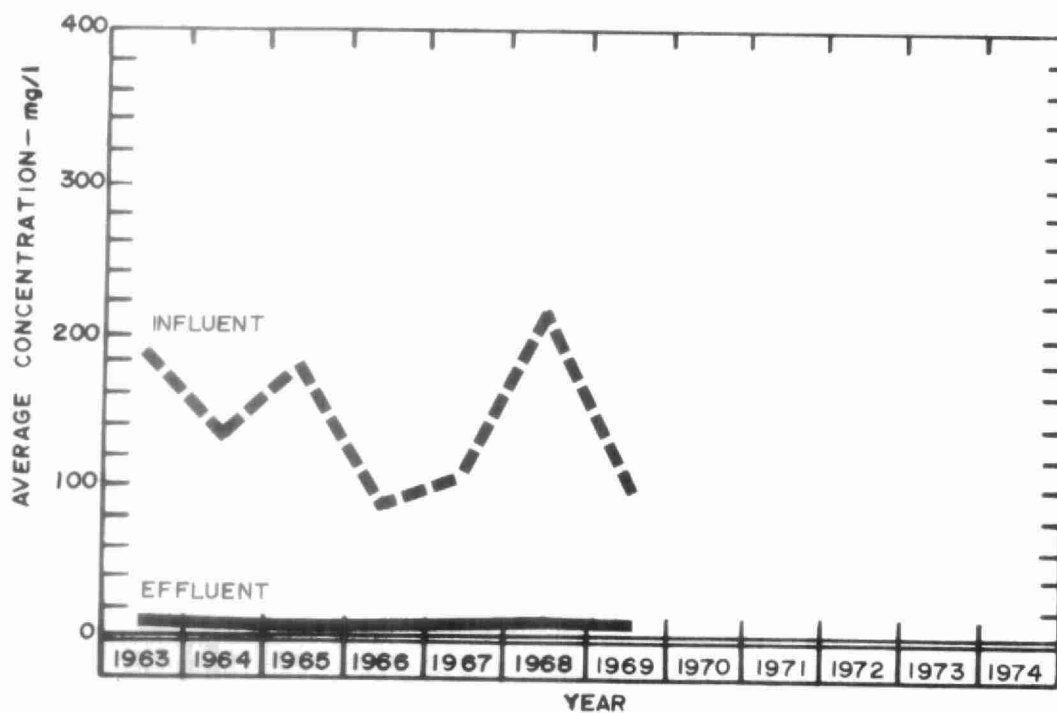
PLANT FLOWS and CHLORINATION

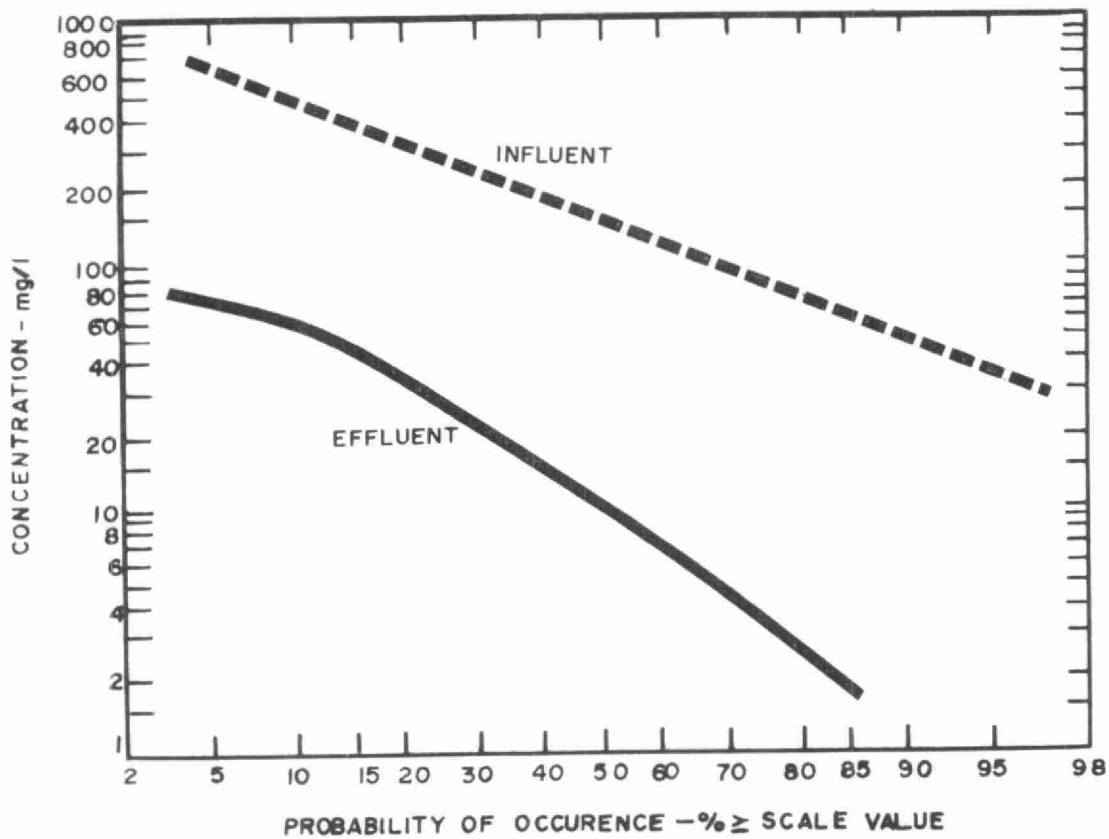
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10 pounds	DOSAGE mg/l
JAN	5.91	.19	.30	.08	0	0
FEB	5.92	.21	.32	.10	0	0
MAR	9.03	.29	.47	.18	0	0
APR	12.39	.41	.52	.28	0	0
MAY	11.97	.39	.50	.23	304*	2.5
JUNE	11.78	.39	.58	.17	296	2.5
JULY	9.72	.31	.51	.16	297	3.1
AUG	11.62	.37	.44	.31	257	2.0
SEPT	12.19	.41	.56	.29	305	2.5
OCT	11.75	.38	.44	.27	315	2.7
NOV	12.55	.41	.57	.20	40*	1.2
DEC	11.62	.37	.56	.19	0	0
TOTAL	126.75	-	-	-	1814	-
AVERAGE	-	.35	-	-	302	2.5

* Chlorine applied between May 1 and November 9.

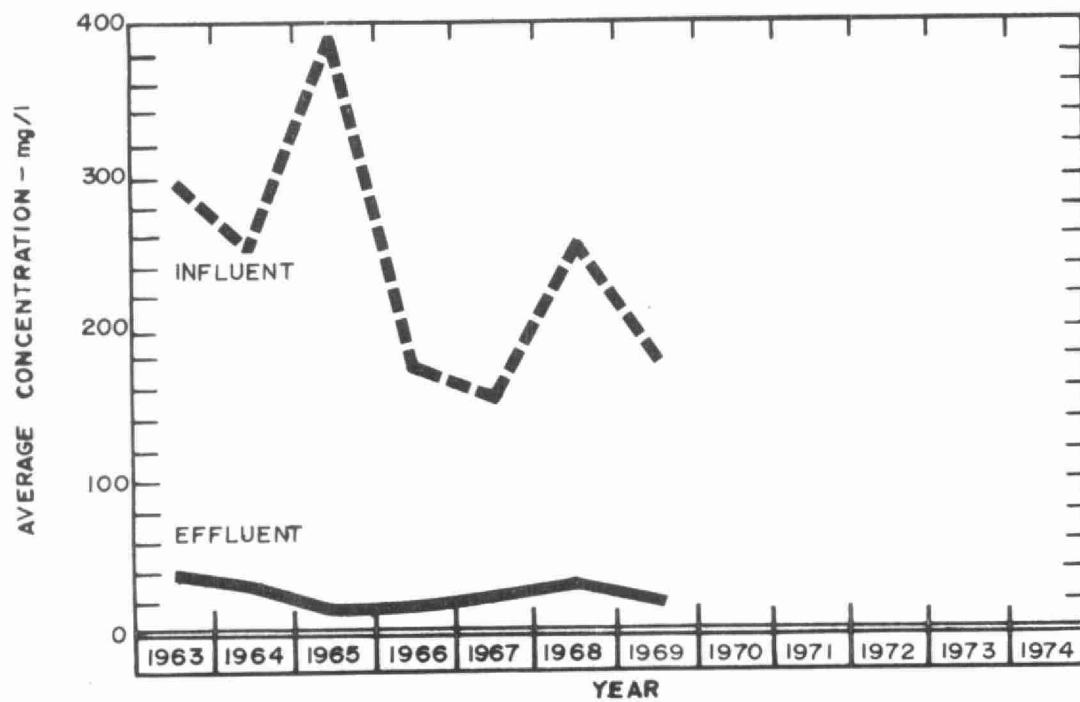


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL cu ft
	INF. mg/l	EFF. mg/l	REDUCTION		INF. CONCN mg/l	EFF. CONCN mg/l	REDUCTION		
			%	10 ³ pounds			%	10 ³ pounds	
JAN	72	9	88	3.7	115	47	59	4.0	0
FEB	58	22	62	2.1	56	32	43	1.4	0
MAR	60	8	87	4.7	113	27	76	7.8	0
APR	36	22	39	1.7	275	50	82	27.9	0
MAY	73	4	94	8.2	102	5	95	11.6	0
JUNE	137	3	98	15.8	310	7	98	35.7	0
JULY	72	1	97	6.8	238	6	97	22.6	0
AUG	102	8	92	10.9	242	7	97	27.3	0
SEPT	111	3	97	13.2	210	5	97	24.9	0
OCT	87	8	91	9.3	121	11	91	13.0	0
NOV	220	14	93	25.9	178	18	89	20.1	0
DEC	100	10	90	10.4	145	26	82	13.8	0
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	97	10	90	9.4	204	19	91	17.5	0

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE lb/DAY
		BOD	SS	BOD	SS				
		mg/l	CONCN mg/l	mg/l	CONCN mg/l				
JAN	.19	72	115	9	47	5250	.01	3.8	-
FEB	.21	58	56	22	32	4990	.01	6.4	-
MAR	.29	60	113	8	27	4590	.02	3.2	-
APR	.41	36	275	22	50	2720	.02	8.4	-
MAY	.39	73	102	8	21	2630	.04	1.8	-
JUNE	.39	137	310	15	83	4340	.04	.9	-
JULY	.31	72	238	8	24	4430	.02	2.2	-
AUG	.37	102	242	11	18	4860	.03	1.4	-
SEPT	.41	111	210	10	21	5880	.03	1.1	-
OCT	.38	87	121	12	19	6390	.02	1.6	-
NOV	.41	220	178	14	18	5760	.06	.6	-
DEC	.37	100	145	10	26	5650	.02	1.4	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.35	97	204	12	32	4790	.03	2.7	-



Date Due

[illegible]

